YURYSHEV, A. V. and TURKIN, V. S.

"Technique of Gas Line and Compressor Station Construction in the USSR."

report presented at the Eighth International Gas conference at Stockholm, 28 30 June 61

YURYZHEV, B.

Results of analyzing title records. Fin. SSSR 19 no.9:49-50 S '58. (MIRA 11:10)

1. Upravlyayushchiy Kostromskoy kontoroy Prombanka.
(Kostroma--Construction industry)

YUMYZHEV, B.

From practice in analyzing the prospective plan. Fin. SSSR 20 no.1:74:76 Ja '59. (MIRA 12:2)

1. Upravlyayushchiy Kostromskoy kontoroy Prombanka.
(Kostroma Province--Economic policy)

YURYZHEV, B.

Are construction trusts needed in Kostroma? Fin.SSSR 20 no.12:60-61 D '59. (MIRA 12:12)

1. Upravlyayushchiy oblastnoy kontory Stroybanka.
(Kostroma Province--Construction industry)

FARBEROV, I.L., doktor tekhn. nauk; YUR'YEVSKAYA, N.P.

Investigating the effect of the moisture content in Moscow Basin lignite on the composition of gas produced in coal channels. Podzem. gaz. ugl. no.1:39-42 '59. (MIRA 12:6)

1. Institut goryuchikh iskopayemykh AN SSSR.
(Moscow Basin--Coal gasification, Underground)
(Lignite--Testing)

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

2

Electroösmotic studies of diaphragms. A. I. Yurzhenko. *Sci. Rept. Leningrad State Univ.* 2, No. 2, 121-31 (1936).—The ζ-potential of diaphragms (gelatin, cellulose, porcelain, Bakelite, paper, sintered glass) does not run parallel with the change in the transport nos. of ions in the pores. Increase in the diam. of the pores leads to an increase in the ζ-potential to a limiting value; at the same time the ionic effects diminish. B. C. A.

COMMON ELEMENTS

MATERIALS INDEX

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

Transference numbers of ions as characterization of electroosmotic properties of diaphragms. I. I. I. Zhukov and A. I. Yurchenko. *J. Applied Chem.* (U. S. S. R.) 9, 9-22(1936).—The effect of gelatin, Bakelite, clay, cellulose, chamois and leather diaphragms on the transference no. of ions was studied. KCl solns. (0.01 and 0.001 *N*) in presence and absence of HCl were used. The nature of the diaphragm and the p_H affect the transference nos.

V. A. Kalichevsky

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

CA

2

Electrokinetic investigation of diaphragms. II. Effect of temperature on the number of ions transported through diaphragms and on their electrokinetic potentials. I. I. Zhukov and A. I. Vurtbenko. *J. Applied Chem.* (U. S. S. R.) 9, 1733-8(1936); cf. *C. A.* 30, 5857[8]. —The transference no. of ions of 0.01 *N* KCl through "marline" (cheese cloth impregnated with celluline) and ceramic diaphragms varied (no. of Cl equal to 0.321-0.338 and 0.289-0.303, resp.) very slightly within 10-80°, attaining a max. at 40-65° (0.336-0.338) for "marline" and at 65° (0.303) for the ceramic diaphragm. The electrokinetic potential of the ceramic diaphragm increased (in abs. value) with increase in temp. by 2-3 mv., disclosing a variation in the charge on the surface of the solid body. The current strength in all expts. was 20-30 ma. Twenty references. **III. Electroosmotic investigation of double diaphragms.** *Ibid.* 1739-44.—A double diaphragm prepd. by depositing a 10% gelatin soln. on a ceramic diaphragm (preventing the penetration of the gelatin soln. into the ceramic diaphragm), had an electrokinetic potential (ζ) equal to ζ' = 3.84 mv. if the gelatin layer faced the cathode and ζ'' = 5.14 mv. if it faced the anode. A diaphragm, prepd. from a filter paper treated with 3-4% formalin and impregnated with a 10% gelatin soln., had ζ = 10.42, and a ceramic diaphragm alone had ζ = −12.23 mv. In all expts., the solns. had p_H = 1.664 and the current strength was 20 ma. The electrokinetic potential of the above double diaphragm increased with increase in the concn. of the gelatin soln. deposited on the ceramic diaphragm. The radius of pores of the ceramic diaphragm was 163 mμ, and that of the 10% gelatin diaphragm was 20-28 mμ. A double diaphragm, prepd. from a ceramic diaphragm with a pore radius of 220 mμ and ζ = −15.85 mv., and with the above gelatin soln., had ζ' = 6.45 mv. and ζ'' = 8.31 mv., and that prepd. from a ceramic diaphragm with a pore radius of 128 mμ and ζ = −20 to −21 and 24, 16, 8 and 4% gelatin solns., had ζ' = 2.3, 1.3, — and approx. 0, and ζ'' = 3.1, 2.2, 1.0 and also 0, resp. The total electroosmotic effect of double diaphragms composed of layers with different electrokinetic potentials, is detd. by the layer with smaller pore radius. Seven references. A. A. Podgorny

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

2

Electrodemosis investigations on diaphragms. IV. Transfer of ions through double diaphragms. A. I. Vurthenko and G. N. Skrynnikova. *J. Gen. Chem.* (U. S. S. R.) 9, 2164-90(1939); cf. Zhukov and V., *C. A.* 31, 2491[4].—For the double diaphragms were used diaphragms consisting of ceramic and gelatin layers. On a moist ceramic diaphragm was added a liquid layer of gelatin of a definite concn. (10-24%). After solidification the gelatin was treated with a 3% soln. of formalin and carefully washed with water. In all cases a HCl soln. was used for an electrolyte. The value of Z was detd. from $Z = 100(n'_{Cl^-} - n_{Cl^-})/n_{Cl^-}$ where Z is the percentage change of the transference no. (TN) in the capillaries of the diaphragm in relation to the TN in a free soln., n'_{Cl^-} is the TN of Cl^- in the capillaries of the diaphragm and n_{Cl^-} the TN of Cl^- in a free soln. Ceramic diaphragms with capillary radii of 165 (I), 185 (II), and 250 (III) mμ were used. The Z value for I at n'_{Cl^-} 0.119 is −31.6, for II at 0.126 is −27.3, for III at 0.145 is −16.8, and for 10% gelatin at 0.314 is 80.4. In an acid medium the ceramic diaphragms were negatively charged and the transfer of Cl^- was decreased. The abs. value of Z decreased with an increase in the radius. In the double diaphragms the following values were obtained for the same ceramic diaphragms covered with 10% gelatin. When the 10% gelatin layer was facing the anode, for I at n'_{Cl^-} 0.197 and 0.198 Z was 11.3 and 11.39; for II at n'_{Cl^-} 0.206-0.208 Z was 18.8-19.8; for III at n'_{Cl^-} 0.232-0.262 Z was 45.2-50.00. When the 10% gelatin layer was facing the cathode, for I at n'_{Cl^-} 0.232-0.243 Z was 33.6-39.0; for II at n'_{Cl^-} 0.229-0.246 Z was 31.6-40; for III at n'_{Cl^-} 0.301-0.313 Z was 78.9-79.8. The double diaphragms were positively charged. An increase of n'_{Cl^-} was obtained always. With an increase of the radius of the capillaries of the ceramic diaphragms the electrokinetic properties of the double diaphragm approached those of the single gelatin layer. The TN through the double diaphragms depended on the position of the diaphragm, i. e., the double diaphragms were asym. The investigation of the transfer of ions through double diaphragms by means of membrane potential gave analogous results. The effect of the pos. gelatin layer increased with the increase of its concn., i. e., with the decrease of the radius of the capillary. 7 references and 3 tables. W. R. Henn

CA

2

Physicochemical study of emulsions of polymerizing hydrocarbons. Conductometric method of sedimentation analysis of emulsions. A. I. Yurzhenko. *J. Phys. Chem.* (U.S.S.R.) 19, 132-9(1945).—The variation of the elec. cond. of an emulsion at a definite level in a centrifuge tube is det. during centrifuging, and from it the particle size distribution in the emulsion is calcd. E.g., an emulsion of CdI_2 stabilized by saponine had a frequency max. at 3×10^{-4} cm., and an emulsion of isoprene stabilized by Na oleate, at 4×10^{-4} cm. I. Hilberman

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Solubility of polymerizing hydrocarbons (monomers) in aqueous solutions of emulsifying agents. A. I. Yu. chenko and S. M. Mints (Leningrad Rubber Plant No 7 Compt. rend. acad. sci. U.R.S.S. 47, 101-3(1945). In the polymerization of rubber-forming substances (I) in emulsions (e.g., in synthetic latex formation), part of the monomer passes from the droplets of the emulsion into the aq. phase under the influence of the emulsifying agent (II). The soly. of the monomer was detd. by shaking an excess of I with an aq. soln. of II for 30 min., and then measuring the n of the aq. phase of the emulsion (III) in an Abbé refractometer. The concn. of I in % by vol., v_o, was calcd. from $v_o = (\rho - \rho_0)/(\rho_1 - \rho_0)$, ρ_0, ρ and ρ_1 being the expressions $(n^2 - 1)/(n^2 + 2)$ for III, a pure soln. of II, and pure monomeric I, resp. II in concn. of 3-5% was sufficient to bring up to 10-15% of monomer into soln. The hydrotropic action of II varied almost linearly with concn.; the effectiveness in solubilizing benzene decreased in the order: K (Na) oleate (IV), NH4 oleate, resin soap (Na salt), Na butyl α-naphthalenesulfonate, Na caseinate. The effectiveness of IV in solubilizing various I decreased in the order isoprene, styrene, acrylonitrile. The solns. of the hydrocarbons are indubitably colloidal in nature; the hydrocarbon would be concd. chiefly in the micelles of II, and the soly. depends on the colloidal state of II itself. Accordingly, addn. of free Na_2CO_3 to solns. of Na oleate sharply decreased the soly. of isoprene. Geo. Gwin

Important rubberizing problems. Kehren. *Holland Textielber.* 25, 376-8(1944).—The vulcanization fastness of dyeings and the acid content of rubberized goods are described and testing methods are discussed for detg. (1) the vulcanization fastness of a dyeing, (2) its stability against hot air, and (3) its stability against superheated steam. Leopold Schiffan

CA

Mechanism of the polymerization of hydrocarbons in emulsions. A. I. Yurzhenko and M. Kolochkova (The S. V. Lebedev Plant No. 743). *Compt. rend. acad. sci. U.R.S.S.* 47, 348-50 (in English); *Doklady Akad. Nauk S.S.S.R.* 47, 354-7 (1945); cf. *C.A.* 40, 4853[9].—Since the mean radius of particles of emulsions of synthetic latexes is 0.015-0.07 mu and that of the emulsions of monomer 3.0-5.0 mu, it is unlikely that polymerization proceeds in the bulk or surface of the monomer droplet. Emulsion polymerization is conceived as proceeding through the stage of colloidal soln. in the aq. phase. By employing soap solns. as emulsifiers, the aq. phase contains 10-15% of the monomer which concentrates mainly in the micelles of the soap. Polymerization occurs in the aq. phase resulting in globules of polymer stabilized against coagulation by the mol. of the emulsifying agent. As the dissolved monomer is used up, new portions of it pass into the aq. phase. This process, owing to the markedly increased interface area in the emulsion, proceeds very fast. The following basic data are in agreement with the above theory: (1) By using solid emulsifiers (bentonite or kaolin) no polymerization resulted, probably because the aq. phase is not hydrotropic. (2) The polymerization rate increases with concn. of emulsifier, other conditions being const. (3) A series of expts. using various phase ratios showed that the polymerization rate increases directly with the relative vol. of the aq. phase. (4) The reaction rates of the emulsifying agents investigated are in the order of their ability to dissolve hydrocarbon monomers: Na (K) oleate > NH_4 oleate > rosin soap > nekal > Na caseinate. (5) By using gaseous monomers latex was formed in soap solns. Evidently in this case the monomer is dissolved in soap. The above concepts do not apply to polymerization of chloroprene where a fine dispersion of polymer is not formed. Lewis J. Ross

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Physicochemical studies of the process of polymerization of hydrocarbons in emulsions. II. The mechanism of formation of synthetic latex in connection with the process of colloidal solution of monomers in aqueous solutions of emulsifiers. A. I. Yurzhenko (Lebedev All-Union Synthetic Rubber Inst., Leningrad). *J. Gen. Chem.* (U.S.S.R.) 16, 1171-88(1946)(in Russian); cf. C.A. 39, 3091[illegible]. A physicochem. study of the emulsion polymerization of styrene, isoprene, and butadiene was made, with Na oleate, NH$_4$ oleate, rosin soap, Na caseinate, and saponin for emulsifiers. It is concluded that the usual concept of polymerization as proceeding in the dispersed phase of the monomer is not satisfactory. The role of the emulsifier goes beyond the indifferent stabilization of globules of monomer and polymer structures. Since the rate of accumulation of polymer is almost linearly affected by the concn. of the emulsifier (with oleates it is most effective), this cannot be explained merely by an increase of interface area. Under polymerization conditions part of the monomer dissolves colloidally in the aq. soln. of the emulsifier. Detn. of soly. refractometrically of styrene, methylstyrene, isoprene, and acrylonitrile placed the above emulsifiers in the same order as was found for the rate of polymerization. Thus, the emulsion polymerization process takes place in the aq. phase in the micelles of the emulsifiers, and the role of the latter is explained by their ability to form colloidal solns. of the monomers. The formation of latex can take place without emulsification of the monomer, merely on contact of the aq. and the hydrocarbon phases. The large area of interface in emulsions favors a rapid satn. of the aq. phase by the monomer, which is important, since the equil. is being constantly disturbed by monomer removal through polymerization.

G. M. Kosolapoff

YURZHENKO, A. I. (Cont'd)

"The Mechanism of the Formation of Synthetic Latexes in Connection with the Process of Diffusion Monomers in Aqueous Solutions of an Emulsifier," 1947. (9900075).

Prize im. Lebedev, 1948, Publ.

C4

30

Dispersion of synthetic latexes at different stages of their formation. A. I. Vurzhenko and S. Minz. *Compt. rend. acad. sci. U.R.S.S.* 55, 335-8(1947)(in English). Latexes were obtained by polymerization of 1,3-butadiene in aq. emulsions stabilized by 4.5% Na oleate. The size of the polymer particles increased with increasing concn. of the latex. Close agreement was found with the equation $r = kc^{1/3}$, where r is the av. radius, k a const., and c the latex concn. For 20.3% latex $r = 0.244$ mμ (found) compared with $r = 0.238$ (calcd.). For 1.5% latex the values for r were 0.106 and 0.091, resp. Smaller particles were obtained when Neval was used in place of Na oleate. (cf. C.A. 40, 4553[9], 4954[1]). Ernest A. Winter

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

33 Synthetic Rubber and Allied Products
2D Polymers from Hydrocarbons

Mechanism of the polymerisation of hydrocarbons in emulsion. A. I. Yerusalimskii and R. Kostrikovs (Compt. rend. acad. sci. U.S.S.R., 1945, 47, 344-50; Doklady, Akad. Nauk U.S.S.R., 1945, 47, 354-7; Chem. Abs., 1946, 40, 1934).—Since the mean radius of particles of emulsions of synthetic latices is 0.05-0.07 mμ and that of the emulsions of monomer 3.0-5.0 mμ, it is unlikely that polymerisation proceeds in the bulk or surface of the monomer droplet. Emulsion polymerisation is conceived as proceeding through the stage of colloidal solution in the aqueous phase. By employing soap solutions as emulsifiers, the aqueous phase contains 10-15% of the monomer which concentrates mainly in the micelles of the soap. Polymerisation occurs in the aqueous phase resulting in globules of polymer stabilised against coagulation by the molecule of the emulsifying agent. As the dissolved monomer is used up, new portions of it pass into the aqueous phase. This process, owing to the markedly increased interface area in the emulsion, proceeds very fast. The following basic data are in agreement with the above theory. (i) By using solid emulsifiers (bentonite or kaolin) no polymerisation resulted, probably because the aqueous phase is not hydrotropic. (ii) The polymerisation rate increases with concentration of emulsifier, other conditions being constant. (iii) A series of experiments using various phase ratios showed that the polymerisation rate increases directly with the relative volume of the aqueous phase. (iv) The reaction rates of the emulsifying agents investigated are in the order of their ability to dissolve hydrocarbon monomers. (v) By using gaseous monomers latex was formed in soap solutions. Evidently in this case the monomer is dissolved in soap. The above concepts do not apply to polymerisation of chloroprene where a fine dispersion of polymer is not formed. 3321123

1946

26

C.A.

Lithographic drying oil based on polydienes. ~~A. I. Yurchenko~~ N. I. Marchenko, and O. L. Glushkina. *Poligraf. Proizvodstvo* 1950, No. 9, 29-30.—The use of a synthetic substitute for linseed oil is described. The substance is polydiene, a low-mol. diene polymer from the by-products of synthetic rubber production. It forms films spontaneously at room temp. in 6-8 days, while addn. of 1.5-3.0% Mn-contg. drier reduces the time to 10-13 hrs. Ca and Co resinates are also effective. The crude product, as obtained from the plant, is polymerized somewhat further to secure more body for lithographic use; this is accomplished by heating at 150° with the above driers until desired viscosity is reached; if low color is desired the drier should not be added until after the thermal polymerization. Tests with offset process rubber sheets showed that very little swelling of the latter occurs on immersion into the synthetic "oil." Color printing run on plant scale with the polydiene of 100 sec. viscosity as the pigment carrier (or binder) was highly satisfactory. G. M. Kosolapoff

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CA

Molecular weight and colloidal (conjugated) solubility in aqueous solutions of dibutyl-α-naphthalenesulfonic acid. A. I. Yurzhenko and R. V. Kucher (Univ. Lvov). *Kolloid. Zhur.* 13, 228-32(1951).—The turbidity τ of soln. of Na dibutyl-α-naphthalenesulfonate (I) was negligible until the concn. c (wt. %) reached 0.01%; at this concn. micelle formation started. On further increase of c, τ increased to c = 2.2% and then decreased, presumably because the scattered light was absorbed by the soln. Between c = 0.5% and 2.2%, c/τ was a linear function of c and was greater in 0.01 *N* H_2SO_4 than in H_2O (pH 6.0) > 0.01 *N* Na_2SO_4 > 0.01 *N* NaOH. The micellar wt. (which is proportional to τ/c at c = 0) was 19250, 20400, 27800, and 32300 in these 4 solvents, resp. The coeff. of diffusion was greater at c 1.45% than at 0.03%. *Solubilization* of Sudan III in I solns. was small at pH 1.8, a little larger at pH 0.6, larger still in 0.01 *N* Na_2SO_4, and largest in 0.01 *N* NaOH; i.e., soly. increased with micellar wt. In all solvents, the amt. of Sudan dissolved by 1 g. I was independent of c between 0.7% and 3%; at pH 12 it was 0.0004 g. One g. Na oleate in 0.1 *N* Na_2CO_3 dissolved 0.0000 g. Sudan, all at 23°. Polymerization of styrene or isoprene also is more rapid in alk. than in neutral or acid solns. of I. The micellar wt. is important for *emulsion polymerization.* J. J. Bikerman

1951

YURZHENKO, A. I.; GUSYAKOV, V. P.

Emulsions

Effect of the concentration and nature of an emulsifier on the degree of dispersion of latexes. Dokl. AN SSSR, no. 1, 1952.

9. Monthly List of Russian Accessions, Library of Congress, December 1952. Unclassified.

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Study of the dispersivity of synthetic latexes by means of the intensity of light scattering. A. I. Yurzhenko and V. P. Gusyakov (Med. Inst., L'vov). *Kolloid. Zhur.* 14, 140-7(1952).—The turbidity τ of synthetic latexes increased with the concn. c of the latex first linearly, then passed through a max., and finally decreased; the greatest concn. studied was 0.5%. At the same c (c_0) at which the linear increase of τ ceased, the light absorption by the latex became measurable; it rapidly increased with c at higher c. The c_0 was 0.001% for butadiene latex (I) contg. diazoaminobenzene as initiator and 3% Na oleate as emulsifier, and 0.01% for a polystyrene latex (II). I was emulsified also by 3% Na dibutyl-α-naphthalenesulfonate and by 3% K laurate. Between the wave lengths λ of 470 and 840 mμ the length of the linear stretch was greater the greater was λ. At very small c values (less than 0.0005-0.001%), τ was a linear function of λ^{-4}, i.e., the Rayleigh law of light scattering was valid. From this law the particle radius r was 38-60 mμ for 4 samples of I and 59 mμ for II. Debye's equation yielded r values of 28-32 mμ for I and 28 mμ for II. From ultramicroscopic observations r of I was 50-87 mμ. For a given emulsifier the increase of τ with c was more rapid the greater the degree x of polymerization. The r increased nearly proportionally to x; this shows that polymerization in an emulsion proceeds by growth of particles rather than by increase of their number. The polymerization was conducted at 50° in N. J. J. Bikerman

CA

2

The micellar weight of alkylbenzenesulfonic acid derivatives in aqueous solutions. A. I. Yurzhenko and R. V. Kucher (Univ. Lvov). *Kolloid. Zhur.* 14, 219-26(1952); cf. *C.A.* 45, 8324b.—Light scattering τ was detd. for wave length 546 A. (light filter). On dilu., τ becomes immeasurably small when the concn. sinks below the crit. concn. C of micelle formation. C was 0.00017 *M*, 0.00010 *M*, and 0.00020 *M* for Na cicosylbenzenesulfonate (I), Na dibutylbenzenesulfonate (II), and Na dibutylnaphthalenesulfonate (III), resp. The high C of III presumably is due to the difficulty of packing naphthalene rings. At higher concns., $^1/_\tau$ is a linear function of concn., and extrapolation of $^1/_\tau$ to zero concn. gives the micellar wt. m. This was 20000 for III, 66000 for II, and 130000 for I, again showing the steric hindrance for agglomeration of naphthalene rings. After adds. of 0.01 g.-equiv. NaOH (to pH 11.8-11.9), m increased to 22300, 91000, and 161000, resp., and at pH 1.8 (in 0.01 *N* H_2SO_4) m was 19300, 61300, and 100000, resp. Presumably, NaOH reduces the true soly. of I, II, and III because of its common ion, whereas acids lower m because micelles of the free acid form. 0.1 *N* Na_2SO_4 increased m to 27700 and 77000 for III and II, resp. Among the 1% solns. of III in H_2O-EtOH mixts. those in 40% EtOH had the greatest τ (about 50 times that in H_2O), whereas for 1% solns. of II the max. occurred in 60% EtOH. This is caused by the dehydrating effect of EtOH. Surface tension γ of H_2O is lowered by I more than by III, which is more active than II at equal mol. concns.; γ is 36-40 ergs/sq. cm. in 0.004 *M* solns. The persistence of single films of II foam was greater in alk. than in neutral solns. J. J. Hikerman

TSVETKOV, N.S., aspirant; YURZHENKO, A.I., professor.

Effect of promoter concentration on the speed of polymerization of styrene in an emulsion. Dop.ta pov.L'viv.un. no.3 pt.2:33-34 '52. (MLRA 9:11)

(Styrene) (Polymers and polymerization)

YURZHENKO, A.I.; TSVETKOV, N.S.

The conjugated effect of the initiator and emulsifying agent on the rate of polymerization in emulsions. Soob.o nauch.rab.chl.VEHO no.1:24-33 '53. (MIRA 10:10)
(Emulsions) (Polymerization) (Emulsifying agents)

Chemical Abst.
Vol. 48 No. 9
May 10, 1954
General and Physical Chemistry

The solubilization of Sudan III in aqueous solutions of alkylbenzenesulfonic acid derivatives. A. I. Yurzhenko and B. V. Kuchar. *Colloid J. (U.S.S.R.)* 14, 311-16 (1952) (Engl. translation). See C. A. 46, 9151a.

1. GUSA OVA, V. F.; YURZHENKO, A. I.

2. USSR (600)

4. Dispersion

7. Study of the dispersion of synthetic latexes in relation to the nature and concentration of the emulisifier and monomer, Koll. zhur., 14, No. 6, 1952.

9. Monthly List of Russian Accessions, Library of Congress, March, 1953. Unclassified.

YURZHENKO, A.I., professor; KUCHER, R.V., assistent.

Study of the speed of diffusion of colloidal electrolytes in aqueous solutions. Dop.ta pov.L'viv.un. no.3 pt.2:35-36 '52. (MLRA 9:11)

(Electrolytes) (Diffusion)

YURZHENKO, A.I., professor; GUSYAKOV, V.P., assistant.

Study of dispersion of synthetic latexes in relation to the nature and concentration of the emulsifier and the monomer. (MLRA 9:11)
Dop.ta pov.L'viv.un. no.3 pt.2:36-37 '52.

(Latex)

YURZHENKO, A.I.

Investigating the double refraction in a stream of solutions of emulsified polymers of 1,3-butadiene. Nauk.zap.L'viv.un. 21:36-45 '52. (MIRA 10:7)

1. Kafedra fizicheskoy i kolloidnoy khimii.
(Refraction, Double) (Butadiene)

YURZHENKO, A.I.; YURZHENKO, T.S.

Effect of phase correlation on the polymerization rate of 1,3-butadiene in emulsions. Nauk.zap.L'viv.un. 21:46-54 '52. (MIRA 10:7)

(Butadiene) (Polymerization)

USSR/Chemistry - Polymerization Aug 52
Peroxides

"The Effect of the Concentration of the Initiator on the Rate of Polymerization in Emulsions," A. I. Yurzhenko and N. S. Tsvetkov, L'vov State U

"DAN SSSR" Vol 85, No 5, pp 1099-1102

The effect of the concn of org and inorg peroxides on the rate of polymerization of styrene in emulsions at various pH of water and concn of emulsifier. The initiators used were potassium persulfate, sodium perborate, hydrogen peroxide, and dimethylphenylcarbinol hydrogen peroxide. With

239T29

the peroxide type of initiator, the polymerization rate first increases with increased concn of initiator, but then slows sown. This is shown graphically by a max on the curve. Lowering the pH results in shifting the max to the side of increased concn of initiator. Submitted by Acad P. A. Rebinder 4 Jun 52.

239T29

YURZHENKO, A. I.

YURZHENKO A. I.

238T19

USSR/Chemistry - Emulsifiers Aug 52

"The Weights of Micelles and Some Colloidal Properties of Sulfonated Emulsifiers," A. I. Yurzhenko and R. V. Kucher, Lvov State U imeni I. Franko

"DAN SSSR" Vol 85, No 6, pp 1337-1340

The size and forms of the micelles of a no of sulfonated emulsifiers were studied with respect to conjugated solubility of oleophillic substances, surface activity, mech properties of adsorption layers, and their behavior in emulsion polymerization of hydrocarbons. The size

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and form of the Na salt of dibutylnaphthalenesulfonic acid, Na salt of dibutylbenzenesulfonic acid, and Na salt of eicosylbenzenesulfonic acid were detd. The colloidal solubility of a typical oleophillic dye (Sudan III) in an aqueous soln of a sulfonated emulsifier was studied spectrophotometrically. By comparing weights of micelles with the molar conjugated solubility of emulsifiers, it is seen that, as the former increases, the capacity of the soap to dissolve oleophillic substances increases. Submitted 23 Jun 52

238T19

USSR/Chemistry - Rubber, Rubber Emulsifiers 1 Sep 52

"The Effect of Concentration and Type of Emulsifier on the Dispersion of Latexes," A. I. Yurzhenko, V. P. Gusyakov, L'vov State U imeni Iv. Franko

"Dok Ak Nauk SSSR" Vol 86, No 1, pp 129-131

Styrene and isoprene latexes were prepd in the laboratory and tested with the following emulsifiers: Na salt of dibutylbenzenesulfonic acid (DBBSK), Na salt of eicosylbenzenesulfonic acid (sulfanol), Na salt of dibutyl-alpha-naphthalenesulfonic acid (nekal) and sodium oleate. Decreasing the concn of emulsifier in the latex increases the size of the particles. This is true for all emulsifiers. When the concn of the emulsifier is over the crit concn, the dispersion of the latex is detd by the dispersion of the emulsifier. At the crit concn, high dispersion latexes form with those emulsifiers whose crit concns are lowest (sulfanol). What happens below the crit concn is still being investigated. Presented by Acad P. A. Rebinder 23 Jun 52.

234T24

YURZHENKO, A. I.

TSVETKOV, N.S.; YURZHENKO, A.I.

Concentration of the emulsifier as a kinetic factor during polymerization in emulsions. Koll.zhur. 15 no.4:308-315 '53. (MLRA 6:8)

1. L'vovskiy gosudarstvennyy universitet imeni I.Franko. Kafedra fizicheskoy i kolloidnoy khimii. (Polymers and polymerization) (Emulsions)

Study of the dimensions and shape of sulfosoap micelles by the method of diffusion. R. V. Kucher and A. I. Vurzhenko (I. Franko Univ., Lvov). Kolloid. Zhur. 15, 145-7 (1953); cf. C.A. 46, 8109f, 9814.—The coeff. D of diffusion was detd. refractometrically. In H_2O D of Na dibutylnaphthalenesulfonate (I) and Na dibutyl benzenesulfonate (II) was approx. 3×10^{-6} cm.²/sec. in 1% and 1.3×10^{-6} in 0% soln. In 0.1 N Na_2SO_4 D depended little on concn. and was near 1.1×10^{-6} and 0.8×10^{-6}, resp. Both I and II had spherical micelles. Na dicetylbenzenesulfonate had $D = 0.36 \times 10^{-6}$, and its length was 70 times its width. The micelles of I in 0.1 N Na_2SO_4 had radii r of 21–17 A. in 0.5–2% solns. Dissoln. of Sudan III (0.8–3.3 $\times 10^{-6}$ g./ml.) increased r to 24–18 A. J. J. B.

YURZHENKO, A. I.

Combined effect of emulsifier and initiator on the rate of polymerization in emulsions. A. I. Yurzhenko and N. S. Tsvetkov (*Dokl. Akad. Nauk. SSSR*, 1953, 90, 421—424).—In the emulsion polymerisation of styrene, the limiting rate of polymerisation (I) and the concn. of emulsifier at which it is attained, decreases with the concn. of $K_2S_2O_8$ initiator; I also increases with decrease in the micellar weight of the emulsifier. The mol. wt. of the polymer increases with the emulsifier concn.

R. C. MURRAY.

Yurzhenko, N. I.

Effect of the electrolytes of the aqueous phase of styrene emulsions on the dispersity of the resulting latexes. N. I. Yurzhenko and V. P. Glazyakov (Med. Inst., Dnepr. Kollod. Zhur. 16, 79-8(1954); cf. C.A. 48, 3601e.—The particle radius r of polystyrene (I) emulsions, produced by polymerization in the presence of 0.6% Na dibutyl-1-naphthalenesulfonate (II), decreased on increasing pH when $K_2S_2O_8$ or $Me_3PbCOOH$ was the initiator, and increased with pH when $(BrO)_3$ was used as the initiator. E.g., at 40° and 0.18% $K_2S_2O_8$, r was 53, 29, and 42 mμ when pH was 1.3, 7.4, and 10.8, resp., and at 45° and 0.02 M $(BrO)_3$, r was 39, 41, and 48 mμ at pH 1.3, 9.8, and 11.5; the pH was adjusted with Na_2CO_3, NaOH, or H_2SO_4, and r was calcd. from the turbidity. The final no. of the latex particles cannot be greater than that of the emulsifier micelles; as the micelles of II are greater, the greater is the pH (they contain 55, 80, and 97 mol. II at pH 1.8, 6.6, and 12.0, resp.), fewer particles are present in alk. solns., and their r (at the const. total concn.) is greater. This is the case of $(BrO)_3$. In the instance of water-sol. initiators, the no. of active radicals of the initiator is greater in alk. soln.; therefore, in acid soln. not all micelles act as nuclei for polymerization, and the resulting r is greater at smaller pH. Small additions of KCl or Na_2SO_4 (up to 0.06 N) lowered, and larger amts. raised r; excessive small additions increased, and large amts. decreased, the no. of micelles of II. KCl had no effect on r of I emulsions after prepn. The mol. wt. (from viscosity) of I was greater (96,000–310,000) when the polymerization took place at pH 11 than at pH 1.26 (41,000–85,000).

J. J. Bikerman

(3)

Submitted April 3, 1952

Furzhenko R. S.

the emulsifier on the p
ZLIVKOV. Rubb. Chem.
abs. 2422. A
25 D3

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R001963220019-8"

YURZHENKO, T.S.; YURZHENKO, A.I.

Effect of nonelectrolites (alcohols) on the rate of styrene polymerization in emulsion and on the dispersion of styrene latexes. Nauk.zap.L'viv.un. 34:15-25 '55 no. 9 (MLRA 9:10)

(Polymers and polymerization) (Styrene) (Latex)

Category : USSR/Atomic and Molecular Physics - Physics of High-Molecular Substances. D-9

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6466

Author : Yurzhenko, A.I., Martynyuk-Lototskiy, Yu.Ye.
Title : Investigation of the Elasto-Viscous Properties of Solutions of Synthetic Rubbers.

Orig Pub : Nauk zap. L'vivs'k. un-tu, 1955, 34, 30-38

Abstract : For the purpose of clarifying the effect of molecular structure and the chemical composition of a polymer on its deformation properties in solution, the latter were investigated in solutions of rubbers of verious chemical nature (natural rubbers, as well as polystyrols with various molecular weights) and synthetic rubbers (poly-isobutylene, butadiene-styrol, and nitryl rubbers). The investigation was carried out with the Shvedov apperatus. It was shown that the composition of the macromolecules affects substantially the elasto-viscous properties and the structurization of the solutions of polymers, and also the viscosity of solutions that have no elastic properties.

Card : 1/1

Yurzhenko A. I.

USSR/Thermodynamics - Thermochemistry. Equilibria. B-8
Physical-Chemical Analysis. Phase Transitions.

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 18530

Author : A.I. Yurzhenko, V.D. Yenal'yev.
Inst : Lvov University.
Title : Study of Distribution of Isppropylbenzene Hydroperoxide between Styrene and Water Phases.

Orig Pub : Nauk. zap. L'vivs'k. un-tu, 1955, Vol. 34, No. 4, 45-50

Abstract : The distribution of isopropylbenzene hydroperoxide (I) between the styrene and water phases at 20°, 35° and 43° was studied. The distribution factor (K) describing the ratio of molar parts of I in the water phase and in styrene decreases with the temperature rise from 0.0639 at 20° to 0.0314 at 43°. Addition of small amounts of NaOH (0.001 to 0.025 n.) causes a decrease of K due to salting out, but at the increase of NaOH concentration to 0.1 n., K rises due to the formation of a I salt soluble in water. Addition of Na_2CO_3 and K_2SO_4 causes salting out of I and a decrease of K.

Card 1/1 - 209 -

Relation between the rate of adsorption of high polymers on carbon black and their molecular weight. A. I. Yurzhenko and I. I. Slinko (Inst. Colloid Chem., Acad. Sci. Ukr. SSR, Kiev). Dokl. Akad. Nauk SSSR 124, 1021-2(1959). The influence was investigated of the mol. wt. of polystyrene, polyisobutylene, and [illegible] polymers on the rate of adsorption of [illegible] on the specific surface of which was [illegible] from benzene soln. in abs. [illegible] of polyisobutylene was adsorbed by fractional deposition and [illegible] were adsorbed on the C black. The adsorption capacity of low-mol. wt. polymers was considerably higher than that of the higher polymers. The adsorption rate was greatly [illegible] used, as shown [illegible] from a no. of systems [illegible] solns. is now [illegible] A. M. Sverdlov.

MT

YURZHENKO, A. I.; Gusyakov, V. P.

"Dispersion of Synthetic Latexes in connection with the Concentration of Micelle Emulsifier" (Dispersnost' sinteticheskikh lateksov v svyazi s kontsentratsiyey mitsell emul'gatora) from the book Trudy of the Third All-Union Conference on Colloid Chemistry, pp420-428, Iz. AN SSSR, Moscow, 1956

(Report given at above Conference, Minsk, 21-4 Dec 53)

weight of high

by carbon black

Kuli Zhur 1958

Translation, 235-8

and polyvinyl

USSR/Chemistry of High Molecular Substances. F

Abs Jour : Referat Zhurnal Khimiya, No 6, 1957, 19442.

Author : N.S. Tsvetkov, A.I. Yurzhenko.
Inst : -
Title : Influence of Inorganic Salts on Process of Polymerization of Styrene in Emulsion.

Orig Pub : Kolloid, Zh., 1956, 18, No 3, 362-368.

Abstract : The influence of Na_2SO_4 and KCl (in quantities of up to 0.1 - 0.02 g-equ/l) on the speed of the emulsion polymerization of styrene in presence of initiators - $K_2S_2O_8$, dimethylphenylcarbinol hydroperoxide (I) and benzoyl peroxide (II) - and of the emulsifier saltless Nekal, as well as their influence on the molecular weight of the polymere were studied by the dilatometric and viscosimetric methods. The polymerization speed curves in presence of $K_2S_2O_8$ and I depending on the concentration of salts possess a maximum (at 0.02 - 0.03 g-equ/l) that is the sharper the higher the con-

Card 1/2 -18-

USSR/Chemistry of High Molecular Substances. F

Abs Jour : Referat. Zhurnal Khimiya, No 6, 1957, 19442.

centration of the initiator and Ph of the aqueous phase are. The authors explain the discovered phenomena by the influence of salts on the colloidal solubility of the monomere. In presence of II, the salts do not influence the polymerization speed within the limits of the studied concentrations. The molecular weight curve of polystyrene depending on the salt content in the polymerized mixture also passes through a maximum corresponding to the salt concentration of 0.01 - 0.04 g-equ/l.

Card 2/2

YURZHENKO, A. I.

Category: USSR/Chemistry of High-Molecular Substances F.

Abs Jour: Referat Zhur-Khimiya, No 9, 1957, 30899

Author : Kucher R. V., Yurzhenko A. I.
Inst : not given
Title : Rate of Decomposition of Isopropyl-Benzene Hydroperoxide in Aqueous Solutions of Emulsifying Agents

Orig Pub: Kolloid. zh., 1956, 18, No 5, 555-561

Abstract: Thermal decomposition of isopropyl-benzene hydroperoxide (I) in aqueous solutions, at 98.5°, conforms to the 1-st order. Rate of decomposition of I increases in the presence of acids and bases, and also on addition of emulsifiers (K-stearate and laurate, Na-oleate). Addition of Nekal accelerates decomposition in acid medium, and retards it in alkaline: on increase of nekal concentration in aqueous solutions from 0 to 3% decomposition velocity constant of I ($K \cdot 10^3$ min^{-1}) increases from 11.4 to 31.4 at pH 0.9, from 0.183 to 0.336 at pH 5.8, and decreases from 1.57 to 0.974 at pH 9.9. Change in order of re-

Card : 1/2

YURZHENKO, A.I.; YENAL'YEV, V.D.

Interaction between organic hydroperoxides and ferrous salts.
Dop. ta pov. L'viv. un. no.7 pt.3:195-197 '57. (MIRA 11:2)
(Chemical reaction, Rate of)
(Hydroxides) (Iron salts)

YENAL'YEV, V.D.; KUCHER, R.V.; YURZHENKO, A.I.

Effect of interphase distribution of hydroperoxides on the rate of certain reactions in emulsions. Dop. ta pov. L'viv un. no.7 pt.3:201-204. 57. (MIRA 11:2)
(Hydroxides) (Chemical reaction, Rate of)
(Emulsions)

YURZHENKO, A.I.; MALEYEV, I.I.

Studying the adsorption of high polymers on carbon black. Dop. ta pov. L'viv. un. no.7 pt.3 204-206 '57. (MIRA 11:2)
(Adsorption)
(Macromolecular compounds)
(Carbon black)

Yur ... Ol ... A. I.

Distr: 4E4/4E2m(J)/4E2l 7

Initiating activity of 1,1-diphenylethane hydroperoxide in emulsion autooxidation of the hydrocarbon. A. I. Vuzh, V. D. Bailey, and A. I. Vuzh (Kiev State Univ., Lenov. Stat. Univ.). Kinet. Kat. 7, 1, 1966, ... Kinetic curves are shown for decomps. of 1,1-dip... (I) (m. 82°) under various condit... ...ane hydroperoxide ... ...ally in 1,1-diphenylethane sol... ...aq. media. The decompo... ...carbon. The ... and 1,1-diphenylethane ... ...the hydro... ...Na_2CO_3 ... ...colloidal ... ...diphenyl... ...rthane by O in basic emulsion ... ...homogeneous phase. The ... ...reaction appears ... ...to be in the aq. phase prod... ...ing up to ... ...% dissolved ... ...of ... ...the RO free radicals.

6
2 May
3

YURZHENKO, A. I.

20-4-26/52

AUTHORS: Kucher, R. V., Yurzhenko, A. I., Kovbuz, M. A.

TITLE: The Oxidation of Cumene by Molecular Oxygen in Emulsions in the Presence of Various Emulsifiers (Okisleniye kumola molekulyarnym kislorodom v emul'siyakh v prisutstvii razlichnykh emul'gatorov).

PERIODICAL: Doklady AN SSSR, 1957, Vol. 117, Nr 4, pp. 638-640 (USSR)

ABSTRACT: The present report studies the velocity of the oxidation referred to in the title in connection with the ratio of the phases and with the nature of the used emulsifiers. The purified hydrocarbon was oxidized in glass retorts by bubbling pure oxygen in a thermostat at 80°C. Specimens for the analysis with respect to the content of hydroperoxide were taken in certain intervals from the reaction mixture. The cumene-phase was further analyzed with respect to the total output of carbonyl compounds. A diagram illustrates the kinetic curves of the output of hydroperoxide of cumene at different ratios of the phases with lacking emulsifier. It results from these data that an increase of the volume of the acqueous phase considerably increases the velocity of accumulation of the hydroperoxide of cumene. These data can also be checked in other systems and show among other things the following:

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20-4-26/52

The Oxidation of Cumene by Molecular Oxygen in Emulsions in the Presence of Various Emulsifiers.

The acqueous phase is the essential kinetic factor in the oxidation of hydrocarbons in the emulsions, since it acts as initiation zone of the process and the hydroperoxides are produced in it. The importance of the acqueous phase for the emulsionlike oxidation still increases substantially in the presence of colloidal electrolytes (emulsifiers) containing a surface-active anion. The emulsifiers accelerate the production of the hydroperoxides at otherwise equal conditions. In the emulsionlike oxidation of the hydro-carbons the initiation of the reaction and the production of hydroperoxide occur mainly in the acqueous phase. The primary initiation of the processes discussed here consists in the production of free hydrocarbon-radicals. Besides the specific influence of the emulsifier on the decay of hydroperoxide of cumene the solubility of the hydroperoxide in the acqueous phase connected with this process must also be taken into account. There are 2 figures, 1 table, and 6 references, 3 of which are Slavic.

ASSOCIATION: State University imeni Iv. Franko, L'vov (L'vovskiy gosudarstvennyy universitet imeni Iv. Franko).

Card 2/3

The Oxidation of Cumene by Molecular Oxygen in Emulsions in the Presence of Various Emulsifiers. 20-4-26/52

PRESENTED: May, 21, 1957, by P. A. Rebinder, Academician.

SUBMITTED: May 3, 1956

AVAILABLE: Library of Congress

Card 3/3

YURZHENKO, A. I., and KHOMIKOVSKIY, P. M.,

"The mechanism of emulsion polymerization."

report presented at the Fourth All-Union Conference on Colloidal Chemistry, Tbilisi, Georgian SSR, 12-16 May 1958 (Koll zhur, 20,5, p.677-9, '58, Taubman, A.B)

Yu Rebinder, P. A.

15(6)

AUTHOR: Rebinder, P. A., Academician SOV/30-59-1-5/57

TITLE: New Trends of Colloid Chemistry (Novyye puti razvitiya kolloidnoy khimii)

PERIODICAL: Vestnik Akademii nauk SSSR, 1959, Nr 1, pp 44-51 (USSR)

ABSTRACT: At present, colloid chemistry plays an especially important part in political economy as it is a physical-chemical science concerning substances of modern engineering. It is of great practical importance that at present it is possible to carry on uninterrupted transitions from lyophobic to lyophilic systems. Thus, it is possible to obtain technically important substances with the required structural-mechanical properties. The theory of highly molecular substances and their solutions has developed into an independent branch of colloid chemistry. The vitality of modern colloid chemistry is proved by the fact that it produces many new independent branches of science. Further, the author describes the course of the 4th All-Union Conference of Colloid Chemistry which took place in Tbilisi on May 12-16, 1958. It was organized by the Otdeleniye khimicheskikh

V. A. Kargin, Z. Ya. Berestneva described the synthesis of aluminum-silicon jelly of crystalline structure.
V. N. Tsvetkov et al. examined the optical properties of macromolecular solutions and their structural peculiarities.
P. A. Dogadkin and collaborators reported on questions of compatibility of polymers and their solutions.
V. A. Kargin, P. I. Zubov and collaborators discussed the process of gelatin formation and its role in sticking processes.
S. N. Lipatov, S. I. Kavatsuk referred to the coincidental results of thermochemical and dilatometrical examination methods of the transition of gelatine jelly into a liquid solution at a rise in temperature.

Card 5/6

A. I. Turbanov and collaborators (L'vov), P. M. Khomikovskiy reported on the clarification of polymerization processes in the state of dispersion.
B. Ya. Yaspel'skiy, Ch'ang-ch'un, S. S. Yarmiskiy, A. P. Piskunov and collaborators examined the process of the influence of active fillers on the processes of structural formation of polymers.
A. V. Pomeranskiy with his school, A. A. Trapeznikov, O. V. Tikhomirov and collaborators examined the properties of soap solutions in connection with their structural peculiarities and the theory of consistent lubricants.
The reports on questions of dispersion systems in polymers showed the utility of a combination of problems of colloid chemistry and the physical chemistry of polymers. The results of the Conference indicate that, besides limited consultations on individual scientific problems, comprehensive congresses are also useful and necessary, uniting the investigators and comprising the results of achievements in wide fields of science. There is 1 Soviet reference.

Card 6/6

of spontaneous dispersion of solid bodies, especially metals, in surface-active surroundings.
V. I. Likhtman reported on the appearance of adsorptive plastification of lead and tin at normal temperatures.
L. A. Konstantinskiy and collaborators examined the influence of rheological properties of printing colors on their behavior in the printing process.
Y. N. Vigdavsiy reported on the regulation of crystallization and coagulation structures in the production of best table-butter.

YURZHENKO, A. I. and MALEYEV, I. I.

(Lvov State Franka University, Lvov, USSR)

"Adsorption of Certain High Polymers by Carbon Black in Dilute Solutions," paper submitted at Soviet High-Polymers, Intl. Conference, Nottingham, Uk,m 21-24 July 1958.

E-3,109,661

5(2), 5(4) SOV/153-58-4-3/22

AUTHORS: Ivanchov, S. S., Yurzhenko, A. I.

TITLE: Thermal Decomposition of Potassium Persulfate in the Presence of Salts of the Acids of the Aliphatic Series (Termicheskoye razlozheniye persul'fata kaliya v prisutstvii soley kislot zhirnogo ryada)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 4, pp 13 - 18 (USSR)

ABSTRACT: Potassium persulfate is an "active" initiator of polymerization processes in emulsions, which is widely used in industry products of a free-radical type are formed in its thermal decomposition. In this connection more and more attention is paid to the kinetics and process of that decomposition, in dependence on the conditions. A survey of the publications so far available is presented (Refs 1-3). The influence exercised by salt additions on the decomposition rate of potassium persulfate is interesting, because in practical use the decomposition takes place in the

Card 1/4

presence of various salts. Accurate data on the influence of the salts mentioned in the title are not available. In the present paper the influence is investigated that is exercised by sodium salts of low fatty acids (from formiate to laurate) upon the polymerization kinetics in the emulsion, if the polymerization was initiated by potassium persulfate. Furthermore, the influence is investigated that is exerted by the above salts upon its decomposition rate (this is the only subject of this report) and the colloidal properties of the emulsifiers. Figure 1 presents experimental results of the decomposition of potassium persulfate in aqueous solutions a) without additions and b) in the presence of salts of fatty acids of various concentrations. As may be seen (Curves 1-3), the decomposition rate of the persulfate increases with increasing sodium-formiate concentration within the whole range of the concentrations investigated. When the next salt - sodium acetate - is introduced, the decomposition rate of the persulfate is increased only to

the concentration of the acetate of 0,02N. Further additions of acetate slow down the decomposition the more, the higher the acetate concentration is. That applies for all other salts up to capronate incl. If sodium caprylate and salts of higher acids are introduced, the persulfate decomposition in all concentrations is accelerated, i. e. the more, the higher the concentration of the additions introduced has been. The authors have come to the conclusion that the salts investigated can exercise different effects in concentrations above 0,02N. These effects depend on the length of the hydrocarbon radical of the anion: the lower salts (up to capronate) slow down the decomposition when large additions are introduced, whereas the decomposition is accelerated by higher ones; sodium formiate shows an anomalous behavior. If the anion radical is lengthened, the persulfate decomposition is accelerated in any case by introducing small quantities of salt. The above mentioned influence is explained by two effects: 1) By a

Thermal Decomposition of Potassium Persulfate in the Presence of Salts of the Acids of the Aliphatic Series SOV/153-58-4-3/22

purely chemical, which is connected with the interaction between the salt and the persulfate, and leads to accelerated decomposition; 2) By the salt-effect which is analogous to that of inorganic salts and slows down the decomposition (in increased concentrations). The latter effect (2nd) is decreased, if the hydrocarbon radical of the salt anion is lengthened, and is no longer visible above caprylate. The behavior of formiate requires further investigations. There are 4 figures, 6 tables, and 4 references, 2 of which are Soviet.

ASSOCIATION: L'vovskiy gosudarstvennyy universitet (L'vov State University) Kafedra fizicheskoy i kolloidnoy khimii (Chair of Physical and Colloidal Chemistry)

SUBMITTED: September 16, 1957

Card 4/4

AUTHORS: Yurzhenko, A.I., Storozh, G.F. SOV-69-20-5-5/23

TITLE: The Effect of Ethylene Glycol on the Colloid Properties of Aqueous Sodium Oleate Solutions (Vliyaniye etilenglikolya na kolloidnyye svoystva vodnykh rastvorov oleata natriya)

PERIODICAL: Kolloidnyy zhurnal, 1958, Vol XX, Nr 5, pp 550-555 (USSR)

ABSTRACT: The addition of alcohols, e.g. methyl, ethyl, n-butyl, and isoamyl alcohol, to aqueous sodium oleate solutions, increases the turbidity and viscosity of these solutions. The addition of ethylene glycol to these solutions is investigated in the article. Figure 1 shows that the viscosity of soap solutions increases with the content of ethylene glycol. The curves for the changes of the relative viscosity of 0.1 M solutions of sodium oleate, depending on the concentration of ethanol and ethylene glycol, are shown in Figure 2,a. The measurements of the specific electroconductivity are presented in Figure 3. The addition of ethylene glycol reduces the electroconductivity, but at maximal viscosity the electroconductivity reaches a constant value. The turbidity curves of the solutions are given in Figure 5. The turbidity decreases rapidly after addition of alcohols, attains a maximum, and decreases again. This fact is in accordance with the theory that the alcohol causes a dehydration of

Card 1/2

The Effect of Ethylene Glycol on the Colloid Properties of Aqueous Sodium Oleate Solutions SOV-69-20-5-5/23

the solutions. An increase of the NaOH content decreases the turbidity and at a concentration of alkali of 0.0005 mole/l hydrolysis of the oleate is completely suppressed (Figure 6). The dependence of the turbidity on the sodium oleate concentration in the presence of various quantities of ethanol and glycol is shown in Figure 7. It is evident that alcohols decrease the turbidity of soap solutions without suppressing hydrolysis. Ethanol and glycol, like alkalis, lower the critical concentration of sodium oleate micelle formation. There are 9 graphs and 9 references, 2 of which are Soviet, 3 German, 2 English, and 2 Swedish.

ASSOCIATION: L'vovskiy universitet im. Iv. Franko (L'vov University im. Iv. Franko).

SUBMITTED: December 24, 1957

1. Sodium solutions--Colloids 2. Sodium solutions--Properties
3. Ethylene glycols--Chemical reactions

Card 2/2

YURZHENKO, A.I. [IUrzhenko, O.I.]; YENAL'YEV, V.D. [IEnal'iev, V.D.]

Investigation of the reactions of organic hydroperoxides with salts of ferrous oxide. Nauk.zap.L'viv.un 46:7-12 '58. (MIRA 12:7)

(Hydroperoxides) (Iron salts)

KUCHER, R.V.; YURZHENKO, A.I. [IUrzhenko, O.I.]; KOVBUZ, M.O.

Means of accelerating the oxidation reaction of isopropylbenzene in the liquid phase. Nauk.zap.L'viv.un. 46:17-20 '58. (MIRA 12:7)

(Cumene) (Oxidation)

YENAL'YEV, V.D. [IEnal'iev, V.D.]; YURZHENKO, A.I. [IUrzhenko, O.I.]

Effect of the relationship of phase to the kinetics of redox polymerization in emulsions. Nauk.zap.L'viv.un. 46:21-25 '58. (MIRA 12:7)

(Polymerization)

YENAL'YEV, V.D. [IEnal'iev, V.D.]; YURZHENKO, A.I. [IUrzhenko, O.I.]

Effect of the concentration of the initiating system on the kinetics of redox polymerization in emulsions. Nauk.zap.L'viv.un 46: 26-33 '58. (MIRA 12:7)

(Polymerization)

GUSYAKOV, V.P. [Gusiakov, V.P.]; YURZHENKO, A.I. [IUrzhenko, O.I.]

Effect of saturated aliphatic alcohols on the scattering light by protein solutions and on their viscosity. Nauk.zap.L'viv.un. 46:34-43 '58. (MIRA 12:7)
(Alcohols) (Viscosity) (Proteins--Optical properties)

YURZHENKO, A.I. [IUrzhenko, O.I.]; MALEYEV, I.I. [Maliaiev, I.I.]

Adsorption of polystyrene, methyl methacrylate polymers, and methyl acrylate polymers on carbon black. Nauk.zap.L'viv.un. 46: 43-47 '58. (MIRA 12:7)
(Polymers) (Adsorption) (Carbon black)

YURZHENKO, A. I. [IUrzhenko, O.I.]; STOROZH, G.F. [Storozh, H.F.]

Effect of lower aliphatic alcohols on the colloidal properties of sodium oleate solutions. Nauk.zap.L'viv.un. 46:48-52 '58. (MIRA 12:7)

(Colloids) (Alcohols)

KUCHER, R.V.; YENAL'YEV, V.D. [IEnal'iev, V.D.]; YURZHENKO, A.I., [IUrzhenko, O.I.], Kovbuz, M.O.

Effect of the molecular weight of tertiary hydrocarbons on their oxidizability in the liquid phase and in emulsions. Nauk. zap.L'viv.un. 46:13-16 '58. (MIRA 12:7)
(Hydrocarbons) (Oxidation)

YURZHENKO, A. I. [IUrzhenko, O.I.]; IVANCHCHOV, D.S.

Polymerization of styrene in an emulsion in the presence of sodium salts of lower aliphatic acids. Nauk.zap.L'viv.un. 46: 161-167 '58. (MIRA 12:7)
(Styrene) (Polymerization)
(Sodium salts)

SOV/ 2o-12o-2-35/63

AUTHORS: Yurzhenko, A. I., Ivanchov, S. S.

TITLE: Influence of the Salts of the Lower Fatty Acid Series Upon Emulsion Polymerization (Vliyaniye soley ryada nizshikh zhirnykh kislot na emul'sionnuyu polimerizatsiyu)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 12o, Nr 2, pp. 349 - 352 (USSR)

ABSTRACT: First, reference is made to a number of pertinent papers published previously. The influence of the sodium salts of the series of lower fatty acids ranging from sodium acetate to sodium laurate upon the polymerization of styrene in emulsion is investigated. The initial styrene (which is by 99,8% a monomer) was treated with a 20% solution of NaOH. It was stored on metallic sodium for some time and then sublimed in vacuum. The data documenting the influence in question upon the polymerization velocity are given in a diagram. The introduction of small amounts of salt (up to a concentration of 0,02 M) increases the reaction velocity. At concentrations above 0,02 M the introduction of the electrolyte has a varying effect

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Influence of the Salts of the Lower Fatty Acid Series Upon Emulsion Polymerization SOV/20-120-2-35/63

according to the nature of the anion. The lower homologs including sodium capronate show an increase of polymerization velocity when salts are added to the polymerization system. When the concentration 0,02 M is exceeded polymerization is retarded. Further details are given. The salts of the fatty acids belong to two groups according to their influence upon the polymerization process: 1) Salts of the lower fatty acids (from the acetate to the capronate). They give the highest polymerization velocity, according to the concentration. 2) The salts of the higher fatty acids (above capronate). The reaction velocity increases continuously with the concentration of the salt in the reaction mixture. The influence of these salts upon the molecular weight of the resulting polymers is similar. The influence of such additions of salts upon the initiation velocity is discussed. In the homolog series of the salts up to capronate the effect of salting out upon the emulgator predominates. Hence, the polymerization velocity and the initiation velocity are gradually reduced. With the salts of caprylic acid and of higher acids the stabilizing effect predominates.

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There are 4 figures and 6 references, 3 of which are Soviet.

ASSOCIATION: L'vovskiy gosudarstvennyy universitet im.Ivana Franko (L'vov State University imeni Ivan Franko)

PRESENTED: January 13, 1958, by P.A.Rebinder, Member, Academy of Sciences, USSR

SUBMITTED: January 13, 1958

1. Styrenes—Polymerization 2. Fatty acids—Chemical properties

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5(4) SOV/20-123-2-32/50

AUTHORS: Yurzhenko, A. I., Ivanova, N. Ya., Yenal'yev, V. D.

TITLE: The Participation of the Emulsifier in the Oxidation Reduction Initiation of Emulsion Polymerization (Uchastiye emul'gatora v okislitel'no-vosstanovitel'nom initsiirovanii emul'sionnoy polimerizatsii)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 2, pp 324-326 (USSR)

ABSTRACT: One of the most important factors influencing the kinetics of polymerization in emulsions is the nature of the emulsifying agent. The nature of the emulsifier used influences not only the velocity of the polymerization process but also the properties of the polymer formed. When investigating emulsion polymerization in the presence of various emulsifiers, the authors noticed several particularities in the development of the polymerization process in connection with the application of cetyl pyridine bromide. In this case the part of the emulsifier is played not only by a purely colloidochemical factor. Investigation was carried out by the dilatometric method in a dilatometer which prevents contact between the polymerization

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system and air. In the case of all experiments, the ratio between the hydrocarbon- and the aqueous—phase was 1 : 9. The hydroperoxide of isopropyl benzene served as initiator, and styrene was used as monomer. Polymerization kinetics was investigated at various temperatures. In the course of one of the test series sodium carbonate was introduced into the aqueous phase. The results obtained by the experiments are shown in a diagram. Conditions otherwise being equal, polymerization develops much more rapidly than if other classes of emulsifiers are used. Cetyl pyridine bromide warrants sufficiently rapid polymerization also at low temperatures (4 and 18°), which is not the case with other emulsifiers. If sodium carbonate is present in the aqueous phase, polymerization velocity passes through a maximum at increased temperatures. In the course of experiments carried out without sodium carbonate, polymerization increases with rising temperature, in which case linear dependence is conserved up to a rather high degree of polymerization. An addition of sodium carbonate and an increase of temperature acts in the same direction (increase of polymerization velocity). The velocity

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of the polymerization process is due to the velocity of initiation. The decay of isopropyl benzene hydroperoxide in an aqueous solution is considerably accelerated by the introduction of cetyl pyridine bromide also if Na_2CO_3 is lacking. This decay is still more accelerated if cetyl pyridine bromide and sodium carbonate are present at the same time. Data concerning the kinetics of this decay at various conditions are given by a diagram. An increase of temperature increases the initial velocity of polymerization and reduces the final yield of the polymer. Also an addition of sodium carbonate produces the same effect. A comparison between these and other data makes it possible to draw the following conclusion: The surface-active emulsifier may play a double rôle in emulsion polymerization: Firstly, it may act as an ordinary emulsifier stabilizing the original emulsion of the monomer, and, secondly, the emulsifier may have the functions of a polymerization activator by causing an induced decay of the hydroperoxide. There are 4 figures and 7 references, 4 of which are Soviet.

The Participation of the Emulsifier in the Oxidation Reduction Initiation of Emulsion Polymerization SOV/20-123-2-32/50

ASSOCIATION: L'vovskiy gosudarstvennyy universitet im. Ivana Franko (L'vov State University imeni Ivan Franko)

PRESENTED: July 3, 1958, by P. A. Rebinder, Academician

SUBMITTED: May 16, 1958

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"Some Peculiarities in the Course of Chain Reactions in Hydrocarbon Emulsions Stabilized by Surface-active Emulsifiers."

report presented at the Section on Colloid Chemistry, VIII Mendeleyev Conference of General and Applied Chemistry, Moscow, 16-23 March 1959.
(Koll. Zhur. v. 21, No. 4, pp. 509-511)

Yurzhenko, A. I.

[illegible] EXPLOITATION

Akademiya nauk SSSR. Institut khimicheskoy fiziki.

Okislenie uglevodorodov v zhidkoy faze; sbornik statey (Oxidation of Hydrocarbons in the Liquid Phase; Collection of Articles) Moscow, Izd-vo AN SSSR, 1959. 334 p. Errata slip inserted. 2,200 copies printed.

Ed.: N. M. Emanuel', Corresponding Member, Academy of Sciences USSR; Ed. of Publishing House: K. M. Dyemyan; Tech. Ed.: I. P. Zul'min.

PURPOSE: This collection of articles is intended for chemists interested in hydrocarbon oxidation reactions, particularly for those specializing in petroleum fuels.

COVERAGE: This collection of 33 articles represents the results of investigations over a period of several years on problems of hydrocarbon oxidation. The authors present their own theoretical and experimental data and also draw from current literature. No personalities are mentioned. References accompany most of the articles.

Dergayev, F.G. (Deceased), P.V. Kiryan, and B.I. Golovanenko [Scientific Research Institute of Synthetic Alcohols and Organic Products]. Kinetics of the Thermal Decomposition of Certain Aliphatic-Aromatic Hydrogen Peroxides 207

The kinetics of the thermal decomposition of the hydroperoxides of isopropylbenzene and of s-butylbenzene, with and without solvents, is investigated at 100-130°C. It is shown that the thermal decomposition reactions of s-butylbenzene and isopropylbenzene hydroperoxides differ greatly.

Fucher, L.V., A.F. Nurzhenko, and M.A. Ryzhus [L'vovskiy gosudarstvennyy universitet imeni Ivana Franko (Lvov State University imeni Ivan Franko)]. Oxidation of Tertiary Hydrocarbons in Emulsions by Molecular Oxygen 212

The rate of hydrogen peroxide accumulation during the oxidation of isopropylbenzene by gaseous oxygen in alkaline emulsions of hydrocarbons was investigated. The presence of emulsifiers increases the rate of oxidation as a result of increased oxygen, hydrocarbon and hydrogen peroxide solubility in the aqueous phase. Solid bentonite emulsifiers were used. Isopropylbenzene is more easily oxidized than 1,1-diphenylethane.

Kvasenkov, M.I. [Moscow State University imeni M.V. Lomonosov]. Oxidation of Aromatic Hydrocarbons by Oxygen 220

The author explains the link between the structure of aromatic and naphthenic hydrocarbons and their stability with respect to oxygen at high temperatures (175-205°).

Nurzhenko, A.I., K.B. Grigor'yeva, N.V. Ar'ye'yev, and M.B. Vilenskaya [Leningradskiy tekhnologicheskiy institut (Leningrad Technological Institute)]. Chromatographic Synthesis of Alkylated Hydrogen Peroxides of the 1, 1-Diphenylethane Series 227

Zaikovskiy, A.I., and Z.N. Sprenk [Institut khimii AN SSSR (Institute of Chemistry, Academy of Sciences USSR)]. Conjugate Decarboxylization in the Autoxidation of Resin Acids 230

The authors have shown that this phenomenon is characteristic of the oxidation process of all resin acids. The results obtained are particularly important for understanding the chemistry of resin acid transformations.

Shuyeve, V.V. [Moscow State University imeni M.V. Lomonosov]. Kinetics of the Reaction of Organic Peroxides with the Iodine Ion 243

The author concludes from the kinetics of the separation of iodine by a given peroxide that it is possible to determine the peroxide qualitatively and quantitatively and to identify its class.

Grubova, L.K. [Institute of Chemical Physics, Academy of Sciences USSR]. Quantitative Methods of Determining Fatty Acids of Normal Structure 249

The author has used paper chromatography to separate mixtures of hydrocarbon acids C_2 to C_4 and their derivatives, and the distillation method to separate methyl esters of acids above C_5 with a carrier.

Rozhkin, P.A. [Corresponding Member, Academy of Sciences USSR] [Vsesoyuznyy nauchno-issledovatel'skiy institut po pererabotke nefti i gaza i polucheniya iskusstvennogo zhidkogo topliva (All-Union Scientific Research Institute of Petroleum and Gas Refining and of Synthetic Liquid Fuel Production)]. Oxidation of Solid Hydrocarbons to Obtain Synthetic Fatty Acids 255

The author discusses the composition of mixtures of synthetic fatty acids, data on neutral oxygen-containing compounds of "secondary nonsaponifiables" of the paraffin oxidation product, and research material on the synthesis of fats in [illegible] alkaline media.

5(2) SOV/21-59-1-16/26

AUTHORS: Kucher, R.V., Storozh, G.F., and Yurzhenko, A.I.

TITLE: The Viscosity of Water Solutions of Sodium Oleate in the Presence of Some Alcohols. (Vyazkost' vodnykh rastvorov oleata natriya v prisutstvii nekotorykh spirtov).

PERIODICAL: Dopovidi Akademii nauk Ukrains'koi RSR, 1959, Nr 1, pp 60-63 (USSR)

ABSTRACT: The water solutions of soaps are usually characterized by means of the so-called first and second critical concentrations of the formation of micelles. It was proved in the described experiment, that apart from the critical micelles concentrations CMC-1 and CMC-2, there exists one intermediate concentration which can be quite accurately determined from the minimum of the concentration curves of a given specific viscosity. Small quantities of alcohols (ethyl,

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The Viscosity of Water Solutions of Sodium Oleate in The Presence of Some Alcohols.

n-butyl, isoamyl, ethylen-glycol and glycerine) in solution lowered the middle critical concentration, and larger quantities raised it. Experiments have confirmed the theoretical data contained in the referred literature , and, therefore, the authors recommend it for guidance. There are 3 graphs and 9 references, 2 of which are Soviet, 2 German, 1 Scandinavian, 2 Japanese, and 2 American.

ASSOCIATION: L'vovskiy gosudarstvennyy universitet im Iv.Franko (The L'vov State University imeni Ivan Franko)

PRESENTED: July 19, 1958, by A.V. Dumanskiy, Member of the AS UkrSSR

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5(4) SOV/69-21-3-12/25

AUTHORS: Kucher, R.V., Yurzhenko, A.I., Kovbuz, M.A.

TITLE: Some Emulsifiers as Kinetic Factors of Cumene Oxidation in Emulsions

PERIODICAL: Kolloidnyy zhurnal, 1959, Vol XXI, Nr 3, pp 309-314 (USSR)

ABSTRACT: The authors report on the effect of a number of emulsifiers (potassium palmitate, Nekal, Leucanol and cetyl pyridine bromide) on the kinetics of oxidation of cumene (isopropylbenzene)(IPB) and on the yield of hydroperoxides (HPC). The maximum rate of oxydation of IPB in emulsion and the maximum yield (70-80%) of HPC were obtained with a 0.5-1% potassium palmitate concentration. Nekal and Leucanol also speed up the accumulation of HPC (~70%), but this process is delayed by a certain period of induction. The effect of Nekal, like that of other colloidal electrolytes, is connected to a considerable extent with the change of the rate

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Some Emulsifiers as Kinetic Factors of Cumene Oxidation in Emulsions

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of decomposition of HPC in the presence of these substances. The effect of the emulsifiers on the rate of oxidation of IPB depends in the main on their colloidal properties (micelle formation, colloid solubility). The cation active emulsifier cetyl pyridine bromide, if introduced into the initial oxidation mixture, noticeably delays the process of HPC accumulation. The introduction of 0.1% cetyl pyridine bromide 30 hours after the initiation of the process stimulates the reaction. In this case, the yield of HPC reaches nearly 80%. The authors mention the Soviet scientists K.I. Ivanov and N.M. Emanuel'. There are 5 graphs, 2 tables and 11 references, 8 of which are Soviet and 3 English.

ASSOCIATION: L'vovskiy universitet (L'vov University)

SUBMITTED: 14 September, 1957

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S/081/61/000/020/076/089
B106/B147

AUTHORS: Kucher, R. V., Kovbuz, M. A., Yurzhenko, A. I.

TITLE: Decomposition of isopropyl benzene hydroperoxide during hydrocarbon oxidation in a homogeneous liquid phase or in an emulsion

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 20, 1961, 321, abstract 20L46 (Sb. nauchn. rabot. In-t Fiz.-organ. khimii AN BSSR, no. 8, 1960, 22-31)

TEXT: The conversion degree of isopropyl benzene (I) into hydroperoxide (HP) at different oxidation degrees of this hydrocarbon was investigated. HP was found to be the only oxidation product in the initial stage of reaction. When the oxidation takes place in an emulsion, the reaction is more intense, and higher concentrations of HP are reached. A study of HP decomposition during the oxidation of I in a homogeneous liquid phase or in an emulsion indicated that rate and mechanism of HP decomposition vary with the degree of oxidation. When the oxidation takes place in an emulsion, the HP decomposition in the oleophase has a similar course as

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Decomposition of isopropyl ... S/081/61/000/020/076/089
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during the oxidation in a homogeneous liquid phase, and the rate constant of HP decomposition drops with progressing reaction. In the aqueous phase, the decomposition of HP is monomolecular throughout the oxidation of cumene in an emulsion, and the decomposition constant rises with increasing degree of oxidation. If the oxidation in a homogeneous liquid phase is stimulated with cobalt stearate, the decomposition rate of HP rises, and by-products of the reactions are formed in a large quantity. After the precipitation of the catalyst, monomolecular decomposition sets in. The results of the investigation can be explained well by a radical chain mechanism of HP decomposition. [Abstracter's note: Complete translation.]

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YURZHENKO, A.I.; IVANCHOV, S.S.; ZARECHNYUK, O.S.

Comparative initiating activity of peroxides of phenylcarboxylic acids in the polymerization of styrene. Sbor. nauch. rab. Inst. fiz.-org. khim. AN BSSR no. 8:63-69 '60. (MIRA 14:3)

1. L'vovskiy gosudarstvennyy universitet im. I. Franko.
(Styrene) (Peroxides) (Polymerization)

S/081/62/000/012/061/063
B158/B101

AUTHORS: Yurzhenko, A. I., Ivanchov, S. S., Zarechnyuk, O. S.

TITLE: Comparative initiating activity of diacyl peroxides of the paraffin series during polymerization of styrene

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 12, 1962, 661, abstract 12R42 (Sb. nauchn. rabot. In-t fiz.-organ. khimii AN BSSR, no. 8, 1960, 70-75)

TEXT: A study was made of the dependence of the initiating activity (IA) of symmetric diacyl peroxides of the fatty series: peroxides of dienanthyl (I), dicaprilyl (II), dipelargonyl (III), dicaprinyl (IV), dilauryl (V), dipalmityl (VI) and distearyl (VII) on the length of the hydrocarbon radical in the molecule. It is established that all the peroxides studied have identical thermal stability, but different IA, which is greater than in the case that the polymerization is initiated with benzoyl peroxide. The dependence of IA, which may be evaluated from the rate of polymerization of styrene, on the length of the organic radical chain of the peroxides studied is represented as a curve with a minimum. With

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reduction in the length of the organic radical in the peroxide molecule in series V to I, an increase in the polymerization rate is observed; then increase is observed with lengthening of the hydrocarbon radical in the series V to VII. The intrinsic viscosity of the polymers did not depend on the length of the hydrocarbon radical of the peroxide and was determined only by the concentration of the latter. [Abstracter's note: Complete translation.]

KUCHER, R.V.; KAZ'MIN, S.D.; YURZHENKO, A.I.

Some kinetic characteristics of the emulsion oxidation of hydrocarbons. Sbor. nauch. rab. Inst. fiz.-org. khim. AN BSSR no.8:132-137 '60. (MIRA 14:3)

1. L'vovskiy gosudarstvennyy universitet im. I. Franko.
(Hydrocarbons) (Oxidation)

68701

S/069/60/022/01/007/025
D034/D003

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AUTHORS: Ivanova, N.Ya. and Yurzhenko, A.I.

TITLE: The Emulsion Polymerization of Styrene in the Presence of Emulsifiers of Varying Molecular Weights

PERIODICAL: Kolloidnyy zhurnal, 1960, Vol XXII, Nr 1, pp 37-41 (USSR)

ABSTRACT: This is a study of the effect of the molecular weight of emulsifiers (sodium salts of fatty acid fractions) on the rate of the emulsion polymerization of styrene and on the molecular weight of the polymer. The polymerization of styrene was carried out in dilatometers [Ref 3] in a water thermostat at 60° C. For all experiments the equation phase of the monomer: water = 1 : 9 was maintained. In order to keep constant the pH of the system, in all cases 0.1 g-equ/l Na_2CO_3 was introduced into the aqueous phase. The results of the study of the colloidal-chemical properties of the

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The Emulsion Polymerization of Styrene in the Presence of Emulsifiers of Varying Molecular Weights

most efficient emulsifiers will be given in a special paper in this journal. As polymerization initiator the authors used isopropyl benzene hydrogen peroxide with a content of 78% active oxygen. Its concentration was equal to 0.01 M with regard to the hydrocarbon phase. The rate of polymerization (Vn) in mole/l-hour was calculated according to the equation

$$Vn = \left[\frac{\Delta S/\Delta \tau}{100} \mu \cdot \frac{1000\, d\mu}{M_o} \right] : \gamma$$

(μ - relative colume of the hydrocarbon phase; γ - relative volume of the aqueous phase; $d\mu$ - specific weight of the monomer at polymerization temperature; M_o - molecular weight of styrene; S - depth of polymerization

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(quantity of polymerized monomer in percent); τ - time in hours; $\Delta S/\Delta \tau$ - tangent of the angle of inclination of the kinetic curves for each emulsifier of the adopted homologous series). The investigation has shown that the rate of emulsion polymerization of styrene in the presence of the mentioned emulsifiers (molecular weight 166.2-336.0) increases linearly with an increase of the molecular weight of the emulsifier from 166.2 to 296.8. On further increase of the molecular weight of the emulsifier, the polymerization process, after having passed a maximum, slows down. For the given homologous series of emulsifiers the maximum corresponds to the mean length of the hydrocarbon portion of the soap C_{17} - C_{19}. The retardation of the polymerization process is associated with change in the colloidal properties

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The Emulsion Polymerization of Styrene in the Presence of Emulsifiers of Varying Molecular Weights

of the emulsifier, i.e., the size and shape of its micelles, which are the main sites of polymerization in emulsions. The formation of large asymmetric micellular aggregates hinders diffusion of the monomer in the micelle, leading to decrease in the reaction rate. Up to a given limit the intrinsic viscosity of polymer solutions increases with the molecular weight of the emulsifier. The authors express their gratitude to F.V. Nevolin, who put at their disposal the fatty acid fractions. There are 3 graphs, 1 table and 6 references, 4 of which are Soviet and 2 English.

ASSOCIATION: L'vovskiy universitet im. Ivana Franko (L'vov University imeni Ivan Franko)

SUBMITTED: December 13, 1958

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